CALFED Bay-Delta Program Project Information Form

Watershed Program - Full Proposal Cover Sheet

Attach to the cover of full proposal. All applicants must fill out this Information Form for their proposal. Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.

1. Full Proposal Title: ***Sutter National Wildlife Refuge Water Conveyance Restoration Project***
   Concept Proposal Title/Number: Sutter National Wildlife Refuge Water Conveyance Restoration Project - **0047**
   Applicant: **Ducks Unlimited, Inc.**
   Applicant Contact: Christopher Sasso, Regional Biologist
   Applicant Mailing Address: 3074 Gold Canal Drive, Rancho Cordova, CA 95670-6116
   Applicant Telephone: (916) 852-2000 Applicant Fax: (916) 852-2200 Applicant Email: csasso@ducks.org
   Fiscal Agent Name (if different from above): Jim Well, Regional Engineer
   Fiscal Agent Mailing Address: 3074 Gold Canal Drive, Rancho Cordova, CA 95670-6116
   Fiscal Agent Telephone: (916) 852-2000 Fiscal Agent Fax: (916) 852-2200
   Fiscal Agent Email: jwell@ducks.org

2. Type of Project: Indicate the primary topic for which you are applying (check only one)

_____Assessment	_____Monitoring
_____Capacity Building	_____Outreach
_____Education	_____Planning
__XX__ Implementation	_____Research

3. Type of Applicant:

_____Academic Institution/University	__XX__ Non-Profit
_____Federal Agency	_____Private party
_____Joint Venture	_____State Agency
_____Local Government	_____Tribe or Tribal Government

4. Location (including County): Sutter

   What major watershed is the project primarily located in:
   _____Klamath River (Coast and Cascade Ranges)
   __XX__ Sacramento River (Coast, Cascade and Sierra Ranges)
   _____San Joaquin River (Coast and Sierra Ranges)
   _____Bay-Delta (Coast and Sierra Ranges)
   _____Southern CA (Coast and Sierra Ranges)
   _____Tulare Basin (Coast, Sierra and Tehachapi Ranges)

5. Amount of funding requested: **$ 521,250**
   Cost share/in-kind partners? __XX__ Yes _____No
   Identify partners and amount contributed by each:

   Sutter National Wildlife Refuge $ 155,000

6. Have you received funding from CALFED before? __XX__ Yes ____No
   If yes, identify project title and source of funds:

Project Name:	**CALFED Number and Funding Amount:**	
Lower Butte Creek Project: Phase II – Preliminary Engineering and Environmental Analysis for Butte Sink Structural Modifications and Flow-through System	99-B02	$ 750,000
Gorrill Dam Fish Screen	96-M22	$ 437,631
M & T/Parrott, Pumping Station and Fish Screen	95-M05	$ 4,165,557
Rancho Esquon/Adamas Dam Fish Screen	96-M21	$ 287,193
San Pablo Bay NWR, Cullinan Ranch / Tolay Creek	97-N18	$ 232,090

By signing below, the applicant declares the following:

1. The truthfulness of all representations in their proposal
2. The individual signing this form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or an organization)
3. The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the Watershed Program Proposal Solicitation Package and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent provided in the Proposal Solicitation Package.

_____

DUCKS UNLIMITED, INC.

_____

Ronald A. Stromstad
Director of Operations

1. Describe your project's underlying assumptions, expected outcomes, timetable for completion, and general methodology or process.

Underlying Assumptions: Approximately 90-95% of California's wetlands have been lost due to urban development and conversion to agricultural uses. In response to this loss, the 2,591 acre Sutter National Wildlife refuge (Sutter NWR) was established in 1945 as part of a complex of refuges to provide habitat for migratory birds, particularly wintering species and those native to the Sacramento Valley of northern California. Sutter NWR also has a direct purpose to attract migratory birds away from unharvested crops (primarily rice) to minimize depredation. These agricultural fields are complementary to refuge objectives in that after crops are harvested, birds using the refuge are able to take advantage of waste grain in the neighboring fields for winter food resources. With continued loss of natural habitat, conversion of wildlife-friendly agricultural crops, and degradation of habitat quality due to urban development, wildlife populations on refuge lands are concentrated and may become more so in the future. This situation has resulted in problems with avian diseases. It is critically important that these refuges and their habitats be managed to provide the highest quality habitat possible. Due to loss of natural flooding regimes and topography, it is recognized that managed wetlands play a vital role in achieving these goals. Anadromous fish populations are also dependent on reliable flows in the Lower Butte Creek system, of which Sutter NWR is a part. To maintain quality habitat for wildlife, the application and management of water on the refuge must be utilized in the most effective and efficient manner possible.

Most of the refuge (85%) is located within the Sutter Bypass (Bypass) north of its confluence with the Tisdale Weir, and it is this portion of the refuge that this proposal refers. Historically, flood flows from the Sacramento River, Butte Sink, and the Feather River inundated large portions of the Sutter Basin. However, most of this land has been protected from flooding by levees and has been developed for agricultural production. Water is used on the refuge to flood and maintain approximately 1600 acres of seasonal and permanent wetlands, manage for an abundance of moist soil plants, and to irrigate watergrass fields. The wetlands support waterfowl food resources such as swamp timothy, smartweeds, watergrass, bulrush tubers, and invertebrates.

The existing water conveyance system within the Sutter NWR does not have adequate capacity to meet the current operational needs of the refuge (See Attachment A). This becomes especially important considering that the Bureau of Reclamation (BOR) is currently negotiating to secure Central Valley Improvement Act (CVPIA) year round water supply for the Sutter NWR. Of particular concern is the primary gravity delivery canal, which is constricted near its entrance at the northeast corner of the refuge, resulting in a substantial head loss and reduced flow capacity. Additionally, the accumulation of silt within the major refuge tracts, threaten to reduce the ability of the existing system to deliver sufficient quantities of water, particularly during dry years. Moreover, since the establishment of the refuge, the water conveyance system has reached a state of dilapidation to the point of marginal operation, and currently is not meeting the following essential management objectives:

- Provide adequate water control for productive wetland management;
- Enhance ability to adaptively manage habitat to address resource needs;
- Control and circulate adequate quantities of water to aid in the prevention or control of avian botulism and other disease outbreaks; and
- Exclude endangered fish species from unsuitable habitats outside of flood events.

The refuge is currently using this broken-down system to attempt water management in extremely flat topography over a long distance (2.5-foot drop in elevation over five miles) with a limited water supply. The refuge has also evaluated the use of wells to supplement surface-water flows. However, the groundwater contains high levels of arsenic and possibly mercury, and has high pumping costs. Currently, the sole source of water for the refuge comes from Lower Butte Creek system (East and West Borrow Canals of the Sutter Bypass), on an as-available basis. The initiation and rate of wetland fall floodup at Sutter NWR are largely driven by water availability from agricultural drainwater flows in the lower Butte Creek system, that typically peak in late August tapering off in mid- to late September. As a result, this has been when the refuge must flood its seasonal wetlands, realizing that after the surge of drainwater subsides inflow capability into the system is greatly diminished. This is much earlier than the natural hydrologic regime. Flooding wetlands at this time provides benefits for early migrants and fulfills the purpose of the refuge to alleviate crop depredation, although depredation problems have been rare in recent years. However, because the climate in the Central Valley is often extremely

hot through September, flooding excessive quantities of wetlands in August or early September can have negative consequences including: increased potential for avian botulism, increased growth of undesirable perennial plant species such as jointgrass (*Paspalum distichum*), and prolific mosquito production. Sutter NWR has a history of problems with these issues, which is why it is of particular concern compared to other areas. An efficient system with a reliable water supply will allow the refuge to be less dependent on flow peaks and permit a hydrological regime more consistent with the biological needs of the species utilizing the refuge.

Seasonal wetlands and watergrass units are the most common habitat on the refuge, (about 90 % of all wetlands) because of their high level of diversity and productivity. They support the large populations of migratory birds that begin arriving in the fall and remain into the spring. The remaining wetlands are maintained into or through the summer for breeding and resident wildlife. Seasonal wetlands are typically drawn down in the spring and remain dry over most of the summer. A portion of them are irrigated once or twice during the summer to bring moist soil plants to maturity and improved productivity. They are then reflooded during the fall to make food resources (seeds, tubers, invertebrates, etc.) available for waterfowl, shorebirds, and other wildlife.

Inefficiency and poor condition of the current water conveyance system has contributed to excessive amounts of undesirable plant species such as jointgrass and cocklebur, and other noxious weeds that have degraded the wetland habitat quality. Summer wetland irrigations cannot be conducted in a timely manner due to inadequate water control structures. Rapid irrigations (7-10 days) are desirable to produce mature stands of annual waterfowl food plants such as smartweeds (*Polygonum* sp.) and watergrass (*Echinochloa crusgalli*), and to reduce undesirable annuals such as cocklebur by drowning or scalding. Inefficient irrigations (2-3 weeks or more) caused by slow flooding can conflict with achieving these objectives by: (a) reducing control of undesirable species (i.e. weed growth will exceed water level increase resulting in reduced control); (b) encouraging vigorous growth of undesirable perennial species such as jointgrass (i.e. longer irrigations result in more growth); and, (c) causing excessive mosquito production (longer duration flooding can result in excessive production of mosquito species that may carry encephalitis, which may result in increased mosquito control activities by local districts).

Although willows are not generally considered an undesirable species, excessive quantities of willow trees have grown up in the interior managed wetlands where there were few or none 15 years ago. This is partly due to unintentional seepage through the degraded canal banks. Over time this vegetation may eventually impact flood flows through the Bypass. The quantity of young trees that currently exist and are proliferating has created a management need to reduce their number and discourage their growth in interior managed wetlands within the refuge. This issue is of particular concern to the local community as a recent levee breech (1997) resulted in extensive flooding outside the Bypass.

Avian botulism has caused significant mortality in wetland birds at Sutter NWR in some years. Outbreaks can kill thousands of birds, especially where populations are most concentrated. Avian botulism outbreaks can occur in the summer, fall or winter, but typically are associated with warm water temperatures and fluctuating water levels during the warmer months. Once started, the disease can spread rapidly. Prevention and control techniques include fresh water circulation and removal of carcasses. With the existing system, wetlands typically flood very slowly, then are put on a minimal maintenance flow (if available) so that main flows can be redirected to flood additional units. The result is poor water circulation. This situation is occurring at a time of the year when migratory bird populations on the refuge are increasing, and the potential for botulism is at its greatest. This project would enhance the ability to use water circulation to help prevent and control outbreaks and to target historic outbreak wetlands with greater flows.

Anadromous fish populations use the East and West Borrow Canals within the Bypass. Specifically, migration of adult and juvenile fish require maintenance of adequate in-stream flows at certain times of year. This is a significant component of watershed conservation in the Lower Butte Creek system. Flows that are diverted by Sutter NWR in the late summer and fall temporarily reduce in-stream flows until wetlands are flooded and return flows enter back into the system. About three months (September through December) are required to fully flood the refuge with the existing system, based on water management data from the Fall of 2000.

This project is an integral part of a fully functioning water conveyance system that would maximize water use efficiency and increase return flows back to the Lower Butte Creek system and to downstream users in the Bay-Delta. Anadromous

fish would derive several benefits. First, under Central Valley Project Improvement Act, Sutter NWR has been guaranteed an annual supply of fish-screened water to be conveyed by the BOR to the refuge's boundary. This project would be joined to the BOR facility at the refuge's northern boundary thus completing the overall water system upgrade. BOR will eventually supply water made available by CVPIA that would off-set the current amount being diverted into the refuge from the Lower Butte Creek system. This will result in a net gain of water, increased in-flows, and decreased impacts on fish transportation flows. Secondly, the new system will maximize water use efficiency by allowing more rapid flood-up and improving the management capabilities of the wetland units. The project is expected to make the system capable of completing floodup more quickly. It will also give the flexibility to schedule the floodup rate more by biological needs rather than depending on peaks of agricultural return flows. Finally, the project design will result in the removal of one portable pumping plant and redesign of one large weir (Weir #1) located on the West Borrow Channel of the Sutter Bypass. The removal of the pump (diversion point) and redesign of the weir will greatly improve adult fish passage and reduce potential juvenile entrainment. Entrainment, due to overtopping during flood events, will be minimized by returning juvenile fish to the lower Butte Creek system utilizing the flow-through design.

Expected Outcomes: This project would restore the existing five-mile water conveyance system and replace or remove 40 water control structures to provide for the following improvements:

- Improved wetland management capability on refuge habitats to support large wintering concentrations of migratory birds, endangered species, alleviation of crop depredation, and wildlife-dependent recreation;
- Increased control of non-native invasive, or undesirable plant species;
- Improved maintenance of flood flowage capacity within the Bypass;
- Improved flexibility to adaptively manage habitat;
- Improved capability to independently manage wetland units;
- Improved water management to minimize mosquito production;
- Reduce the potential for avian disease outbreaks by improving water circulation;
- Improved water supply reliability to the Bypass Canal and Butte Creek by reducing ditch-loss from seepage;
- Increased in-stream flows and decrease impact on fish transportation flows in the fish channel;
- Increase the speed at which water is conveyed through the series of wetland units and returned back to main flow channels for the benefit of anadromous fish species;
- Improve conditions for adult fish passage; and,
- Reduce potential juvenile entrainment.

Timetable for Completion: Depending on contract execution, it is anticipated that all environment documentation (Environmental Assessment, FONSI, Endangered Species Consultation) will be completed by September 1, 2001 and construction will be completed by September 30, 2002.

General Methodology and Process: Rehabilitation of the existing internal system was selected because it would allow improved wetland management capability without reliance on portable pumps and management of dilapidated and unsafe weir structures. A USFWS report in 1990 documented deficiencies in the existing system and suggested improvements mostly related to increasing its capacity. These deficiencies were confirmed by Ducks Unlimited, Inc. (DU) engineers during surveys conducted in 2000. Based on elevational surveys, the proposed system upgrade is logical in that it includes a main delivery canal that would efficiently distribute water throughout the length of the refuge. Most of the construction will involve rebuilding and raising the levees and installing water control structures. Lowering the canal floor is not an option because the area is extremely flat with a high water table and a shallow hardpan. To build a completely new system from "scratch," would be much more costly and would also require destroying the existing system. The completed project would be the sole conveyance system of fish-screened water for Sutter NWR wetlands within the Bypass.

USFWS staff at the Sacramento NWR Complex will conduct an Environmental Assessment to ensure due diligence regarding associated impacts and mitigations. All associated permits and approvals will be identified. Due diligence will also be exercised by USFWS to prepare for and initiate project design and implementation. Highly qualified engineers are on contract to complete project scoping and design together with associated mitigations. Contracts will be negotiated and secured to ensure appropriate commitment from all the partners for project success. Scrutiny will be given to ensuring appropriate permitting and agency approval for all phases of the project.

2. Describe your qualifications and readiness to implement the proposed project.

a. Describe the level of institutional structure, ability and experience to administer funds and conduct the project. Identify the fiscal agent responsible for handling the funds.

The fiscal agent for this project will be Ducks Unlimited, Inc. (DU), Western Regional Office in Rancho Cordova, CA. DU is a national non-profit organization that administers approximately $118 million of restoration project funds on an annual basis. The organization is the world's largest private waterfowl and wetlands conservation organization. The Western Regional office employs experienced and highly qualified engineers and biologists to ensure the best design and construction. Comprehensive environmental review and monitoring is conducted for all projects. As the fiscal agent for this project, Ducks Unlimited, Inc. agrees to the Terms and Conditions for CALFED Funding Agreements as stated in SECTION 8: TERMS AND CONDITIONS of the CALFED Watershed Program Proposal Solicitation Package.

b. Describe technical support available (including support needed for environmental compliance and permitting) to begin and complete the project in a timely manner.

Ducks Unlimited, Inc. has drafted engineering plans and cost estimates for the project. The Sutter NWR has technical and administrative staff who will prepare an Environmental Assessment for the project, including compliance with all necessary permitting requirements. The EA/FONSI (if appropriate) is anticipated to be complete by September 1, 2001. Initiation of construction would commence in the spring of 2002 and completion is anticipated by September 2002. The following is a list of the qualified personnel assigned to this project:

Ducks Unlimited, Inc.:	Jim Well, P.E.. Regional Engineer Vince Thompson, P.E. Chris Sasso, Regional Biologist
USFWS:	Kevin Foerster, Refuge Manager Mike Peters, Assistant Refuge Manager Mike Wolder, Wildlife Biologist

c. List of previous projects of this type you or your partners have implemented, funded either by CALFED or other programs.

A project similar to the proposed project was recently implemented on nearby Colusa NWR in 1999 that included a 448-acre habitat restoration and three-mile canal rehabilitation. Partners on the project included U. S. Fish and Wildlife Service, U. S. Bureau of Reclamation, Ducks Unlimited, Inc., California Waterfowl Association, California Department of Fish and Game, and Ottenwalter Laser Leveling. The overall cost of the project was approximately $550,000. The EA/FONSI was completed by Sutter NWR staff together with all required permitting.

A number of other wetland habitat enhancement projects have been recently implemented on Sutter NWR, including the following:

Name	Date	Partners	Amount
Tract 18	1993	DU*	$10,000
Tract 2	1997	NAWCA/CWA*	$40,000
Tract 8	1997	NAWCA/CWA	$38,000
Tract 20, cells 2-3	1998	DU/CA State Duck Stamp	$40,000

*DU - Ducks Unlimited, Inc.
NAWCA - North American Wetlands Conservation Act
CWA - California Waterfowl Association

Project Name:	CALFED Number and Funding Amount:	
Lower Butte Creek Project: Phase II – Preliminary Engineering and Environmental Analysis for Butte Sink Structural Modifications and Flow-through System	99-B02	$ 750,000
Gorrill Dam Fish Screen	96-M22	$ 437,631
M & T/Parrott, Pumping Station and Fish Screen	95-M05	$ 4,165,557
Rancho Esquon/Adamas Dam Fish Screen	96-M21	$ 287,193
San Pablo Bay NWR, Cullinan Ranch / Tolay Creek	97-N18	$ 232,090

3. Provide a completed budget cost sheet and describe the basis for determining project costs, including comparisons with other similar projects, salary comparisons, and other listed costs. Include all costs of environmental compliance, such as CEQA and/or NEPA, and permits. Describe how the approach to achieving the stated goals of the project demonstrates an effective cost relative to its anticipated benefits. (See Attachment B)

Basis for determining costs:

Costs were estimated based on DU's procedures using previous bid results of furnishing and installing like items and tempering for specific project conditions.

Comparisons with other similar projects:

In the area, a complete water delivery system for Colusa NWR West Side was engineered and constructed in 1999. A complete redesign and partial construction of the water delivery system for Gray Lodge Wildlife Area began last year and is continuing. In addition a complete redesign and installation of a water delivery system at Merced NWR occurred in 1999 and 2000.

Cost comparisons:

Costs used on this project are based on actual costs incurred on similar items of work that occurred on Gray Lodge Wildlife Area, Colusa NWR, and numerous other projects completed in the Central Valley by DU in the last three years.

Demonstration of cost relative to anticipated benefits:

Based on the current condition of refuge water delivery system, topographic terrain, and FWS requirements, a gravity system was determined to be the most economical from an initial construction cost and annual operation and maintenance costs. This system is in a flood plain and is inundated almost annually. In addition the area receives considerable public use. The design had to take these items into consideration to pass environmental and management criteria.

4. Describe the technical feasibility of the proposed project.

a. Describe any similarity to previously implemented successful projects in the community or elsewhere.

This project is very similar to the habitat restoration plan for Tract 24 at Colusa NWR (see 2.c.). It included the rehabilitation of an existing canal system and the restoration of 448 acres of wetlands and upland habitat. The project involved improving the capacity of an existing gravity delivery canal to 80 cubic feet per second (cfs) to efficiently supplying water to 2,600 acres of wetlands and by reducing the need for using agricultural drain water. The project included installation of water control structures along a 3-mile length of the canal and the construction of two large siphons. The project was successfully implemented in 1999 and achieved the desired water management objectives. The Colusa NWR project was designed to distribute water delivered under the provisions of the Central Valley Project Improvement Act. The Sutter NWR project is also designed to duplicate the same benefits and help to fully implement the Central Valley Project Improvement Act.

b. If the project proposed a new approach or new method with a high likelihood of adding new knowledge and/or techniques, or with the potential to fill identified gaps in existing knowledge, describe how it will do so, and what monitoring components will provide substantiation of results.

Although no new approach or new method is being utilized for this project, there may be new opportunities to document unforeseen habitat and wildlife responses to the new system.

c. Explain how the finished project will be maintained as necessary, and to what degree it may require continued funding from outside the community.

The completed project will be maintained by the USFWS. It is designed to conform to standards conducive to safe operation and management relative to the existing system. There is a full-time irrigator/engineering equipment operator stationed at Sutter NWR supported by full-time personnel from the other five refuges within the Sacramento National Wildlife Refuge Complex to conduct operations and maintenance on new improvements and existing infrastructure. These staff will conduct annual maintenance such as levee and water control structure repairs, as well as daily operations of water distribution, water level management, and communication with associated water entities such as water districts and the Department of Water Resources. Costs associated with operations and maintenance of the system will be provided by the annual Sutter NWR budget.

5. Describe how the monitoring component of the project will help determine the effectiveness of project implementation and assist the project proponent and CALFED with adaptive management processes.

a. Identify performance measures appropriate for the stated goals and objectives of this project.

Performance Measures:

An overall increase in water delivery capacity compared to the existing system. Under the full implementation of CVPIA, the BOR is mandated to provide Sutter NWR with up to 65 cfs, delivered to the refuge boundary. This project will require the capability to convey and distribute that 65 cfs, as the sole water source, throughout the refuge for optimum management capability.

Ability to distribute greater flows, including initial flood-up and maintenance, to more wetland units simultaneously. With the existing system, only several units can be flooded at a time, and maintenance flows for units at operational levels may be sacrificed to flood additional wetlands or vice versa. In addition, the new system will allow greater flexibility to independently manage more wetland units (i.e. flooding, irrigating, or drawing down one unit would not necessarily require the same for others).

An overall increase in ability to flood individual wetland units and to complete the overall flood-up of the refuge in the fall more effectively. This in turn would allow quicker return of diverted flows back into the Bypass borrow canals.

b. Describe how this project will coordinate with and support other local and regional monitoring efforts.

Information developed through the implementation of the project would be available to the public. Data on wildlife use, water use (amount, timing, duration) and habitat is collected annually. Information on water regimes and other habitat management based on this data are routinely exchanged through interaction of the Sacramento NWR Complex with other agencies, non-government organizations, private landowners, school groups, and other members of the public. Two full-time private lands biologists specifically assist landowners with habitat-related projects (often wetland or riparian), providing information on incentive and conservation easement programs, and technical assistance. Annual meetings that allow for information exchange include a statewide wetland management workshop and local duck club workshops. Presentations from studies or projects on the complex are regularly given at workshops, conferences, professional meetings (i.e., Wildlife Society), school group presentations, and other forums. The Sutter NWR staff attends an annual Rice Advisory meeting, along with local landowners and industry representatives to discuss and document any crop depredation/refuge management issues that need to be addressed. The staff also holds annual meetings with mosquito control districts to exchange information on mosquito control efforts and refuge management, including ways to reduce pesticide use through water management.

The Sacramento NWR Complex, including Sutter NWR, will be involved in a Comprehensive Conservation Planning process, scheduled to start in 2003. This process will include public meetings, and will result in a 15-year management plan for the refuge. For Sutter NWR, water management will be a significant component. Biological and water management data will be evaluated and available for interested parties. The refuge attends all meetings of the Lower Butte Creek Steering Committee and the Sutter Bypass Action Committee and is active in all fisheries related actions pertaining to the Lower Butte Creek watershed.

c. Provide a description of any citizen monitoring programs that will be part of this project.

Not applicable. No citizen monitoring will be conducted on this project.

d. What monitoring protocols will be used, and are they widely accepted as standard protocols.

Daily water use is monitored and documented by refuge staff. Monthly water use reports are supplied to the Bureau of Reclamation. Annual habitat management plans track the water management of individual wetland units. Planned flood-up, irrigation, and drawdown schedules are generated based on biological needs (i.e. wildlife population levels), water availability, and required maintenance. Data is then collected on the actual unit flood-up, irrigation, and drawdown dates, and time that is required for water to "cover" them. Collectively, this data provides an index of system's capability and efficiency. The information can be compared from year to year and management modified if necessary (or possible) to adapt to wildlife needs and other management concerns.

Wildlife data is also collected to index populations and determine the effectiveness of management regimes. Waterfowl, shorebirds, other waterbirds, raptors, and a variety of other species are surveyed along standardized ground routes twice monthly from October through April and once monthly from May through September. Estimation of waterfowl and other species numbers by ground or air is used regularly on similar areas and is considered an acceptable method for indexing populations, monitoring migration patterns, and species composition. Avian disease mortality is also monitored. Data is collected by unit, so that it may be correlated back to water regimes and other habitat management.

e. Describe how the type and manner of data collection and analysis will be useful for informing local decision making.

By documenting the capacity of the system, the speed and efficiency that water can be delivered, and the corresponding wildlife use, informed decisions can be made to address problems or needs that may arise. Flexibility of management to address such issues as water constraints, disease problems, maintenance issues, mosquito control, or other management concerns is extremely useful. One of the most valuable benefits from this knowledge will be the ability to effectively manage the refuge during drought conditions when water deliveries are reduced. The above information would help predict which wetland units support the greatest abundance of wildlife, have had the least amount of historic disease problems, and are most efficiently maintained.

6. If this project is to develop specific watershed conservation, maintenance or restoration actions, describe the scientific basis for the action(s) described in the proposal. Include the following:

a. Any assessment of watershed condition(s) that has already been developed by you or others.

The Central Valley Habitat Joint Venture Implementation Plan has been developed to address waterfowl conservation and management within the Central Valley of California. This plan addresses objectives for the following categories within the Central Valley: biological and habitat protection, water and power, wetland restoration and enhancement, agricultural land enhancement, and evaluation and monitoring. This project meets program goals for each of these categories.

b. Previous assessment(s) used to establish your project goals and objectives, or to inform the basic assumptions of your proposal.

As part of an on-going watershed restoration program (Lower Butte Creek Project), this project is the outcome of an extensive assessment of habitat and biological needs, hydrology, water control structures, competing uses, legal, regulatory and technical obstacles, feasibility and economic considerations conducted by the Lower Butte Creek Steering Committee. The committee consists of leaders from the local irrigation and reclamation districts, appropriate state and federal resource agencies, water user constituency organizations, conservation groups, waterfowl organizations and sporting interests. The steering committee was created to provide guidance to the Lower Butte Creek project and the project consultants. The committee is responsible for conducting preliminary discussions, analysis and guidance on project issues, including project expectations, technical data collection, development of fact sheets and other documents, water issues, preliminary evaluation considerations for alternatives development and preliminary alternatives. This information has been compiled and summarized in Technical Memorandums approved by the committee and articulates clear restoration goals and tangible, measurable objectives to provide direction to restoration efforts and to measure progress. Copies of these Technical Memorandums may be obtained by request from Duck Unlimited, Inc., Rancho Cordova, CA.

c. A description of the scientific assumptions used to develop the project goals, objectives and proposed actions, and the degree to which those assumptions are widely accepted (both in the science community as a whole, and in the watershed community).

Scientific Assumptions:

- Increased water supply will improve conditions for aquatic and terrestrial species in the Sutter NWR.
- Increased water circulation within the wetlands of the Sutter NWR may reduce the potential for avian diseases and increase the ability to control outbreaks if they occur.
- Increased water supply will improve in-stream conditions and in turn protect and enhance the life cycle of anadromous fish and other aquatic species.
- More efficient water management will benefit desirable plant species and help control undesirable plant species.

Acceptability:

The above-mentioned scientific assumptions are recognized and accepted by the scientific community and have become management objectives within the broader CALFED Program. (See CALFED Ecosystem Restoration Plan Vol. 1 & 2) Scientific peer review has been conducted throughout the Lower Butte Creek Project to ensure acceptable management alternatives that uses the best science available to conceptualize and prioritize implementation actions that fit the ecosystem approach to the Lower Butte Creek. This project has the endorsement by the stakeholders of the Lower Butte Creek Project and has met scientific and social acceptability standards.

d. A discussion of how the proposed actions are (are not) consistent with the scientific assumptions and previous assessments completed in the watershed.

Extensive scientific and peer review has been conducted by the Lower Butte Creek Project Steering Committee regarding identified restoration activities within the Sutter Bypass on lower Butte Creek. Documentation of these reviews and recommendations has been summarized in Technical Memorandums for the stakeholders of the Lower Butte Creek Project. These Technical Memos characterize the assumptions described in this proposal and substantiate the need for a system upgrade described in this request for funding.

"As with the Butte Sink, the seasonal and permanent wetlands of the Butte Slough and Sutter Bypass support large concentrations of migratory and resident waterfowl. They are also an important migratory and nursery area for salmon and steelhead of Butte Creek, as well as the upper Sacramento River and its tributaries during high water years. The canals, sloughs, and flooded lands of the Sutter Bypass are an important spawning and nursery area for Sacramento splittail, a fish species proposed for federal listing as threatened. During high water years, many salmon and steelhead migrate to and from the upper Sacramento River and its tributaries through Butte Slough and the Sutter Bypass via overflows from the Tisdale, Colusa, and Moulton Weirs." Tech Memo 1 p. 2-20

"The Lower Butte Creek Project area, particularly Butte Sink and the Sutter National Wildlife Refuge, supports one of the largest contiguous block of managed waterfowl and riparian-forested wetland habitat in the western United States. These were historically natural habitat areas whose resource values are now maintained only by proper water management to cultivate conditions necessary to wetlands maintenance. Water is used to grow and support waterfowl forage, provide habitat for numerous waterfowl and other wildlife and plant species, and maintain the water quality and viability of these habitats." Tech Memo 2 p. 1-8

"The purpose of this study as it was originally scoped, included the following efforts:

- Determine the most effective modification to the West Borrow Canal between and including WEIR #3 and WEIR #1 to improve this fish passage;
- Coordinate with Butte Slough Irrigation Company and other water users on the proposed upgrade of West Borrow Canal structures;
- Evaluate sub-irrigator reliance on water stage in the West Borrow Canal;
- Produce cross sections on the West Borrow Canal at WEIR #3 and the Guisti WEIR;
- Analyze canal geometry at WEIR #3 and the Guisti WEIR to determine the best potential configuration, design capacity, and orientation of proposed structure upgrades;
- Develop conceptual designs of upgraded water control and fish passage structures; and,
- Develop of cost estimate for proposed structure upgrade as well as for operations and maintenance."

Lower Butte Creek Project - Phase IB - final Task Report
Task 7: Analysis of Sutter bypass/west borrow canal (below WEIR 5). October 29, 1999.

e. A description of what baseline knowledge was used to support the management actions described in the proposal, or the likelihood that the management actions will generate more robust baseline knowledge.

Annual habitat management plans are generated by Sutter NWR. The purpose of these plans is to guide and document management activities and maintenance work within the Sutter NWR. Data from biological surveys (i.e., wildlife, vegetation, research projects, etc.) are used to evaluate and refine habitat management activities to ensure that refuge objectives are being met. This "system" is designed to be adaptive and responsive to changes in the needs of wildlife and to assess impacts of various refuge management issues. The refuge has been compiling this data for 15 years and has abundant baseline data to support the implementation actions described in this project. Future data collected for the annual reports will enrich the on-going assessment of project success and adaptability.

7. A. How will the proposal address multiple CALFED objectives (see Section I) in an integrated fashion, with emphasis on water supply reliability, water quality, ecosystem quality, and levee stability objectives CALFED has established for Stage 1 of the program?

Water Supply Reliability: This project will contribute to more efficient management of water supplies to the Sutter NWR that in turn will provide a more reliable water supply to meet flow requirements for fish and wildlife within the Butte Creek system and contribute to reducing the impacts of water diversion on the Bay-Delta system.

Ecosystem Quality: This project will contribute to restoring flows within the Butte Creek system that will help create favorable habitat conditions for native and listed species. The restored flows will improve and increase aquatic and terrestrial habitats and improve ecological functions within the Butte Creek Watershed bringing downstream benefit to the Bay-Delta system. This improved streamflow supports important ecological processes such as riparian corridors and invertebrate production and fish spawning, nutrient and organic transport and sediment transport and decomposition that replenish riverine aquatic habitats.

B. Explain how the proposal will help define and illustrate relationships between watershed processes (including human elements), watershed management, and the primary goals and objectives of the CALFED (Section I).

This project has built a partnership with the Sutter County Board of Supervisors in an effort to ensure that proposed restoration work will be compatible with Sutter County Public Works Department. The County has asked for assurances that refuge improvements will not impede flood flows within the Sutter Bypass. Working together on this issue has broadened the relationship with Sutter County and the refuge and maintained a good exchange of information. The open channel of communication will promote other opportunities to partner on projects where refuge and county interests overlap.

The project is an integral part of a water delivery system in the Sutter Bypass that benefits the refuge and agriculture. The completion of restoring this water conveyance will assist in implementing the Lower Butte Creek Project goal of "developing mutually beneficial and acceptable alternatives to improve fish passage while maintaining the viability of agriculture, seasonal wetlands and other habitats." This project also meets CALFED Ecosystem and Water Supply Reliability objectives to restore quality to the Bay-Delta. This is an example of how local partnerships between stakeholders have the opportunity to collaborate and combine their resources to reach common goals.

This project is directly involved with the Lower Butte Creek Project, a consortium of local stakeholders comprised of landowners, leaders from local irrigation and reclamation districts, state and federal resource agencies, water user constituencies and waterfowl organizations, porting interests, watershed groups and consultants. Project goals have been designed around CALFED Bay-Delta objectives and involve CALFED funding. CALFED policies have been reviewed and discussed by all participants in the development process. The fish passage facilities are being developed as a direct response to CALFED policies and programs. Technical Memorandums have been written and widely distributed that thoroughly discuss how this community-based project meets implementation goals of Bay-Delta Program.

C. Identify a lead agency for environmental compliance, such as CEQA or NEPA. Describe the program's strategy and timetable on environmental compliance.

USFWS will be the lead agency for completing a NEPA document for this project. An Environmental Assessment (EA) and FONSI (if appropriate) will be prepared, considering a number of alternatives, including a preferred alternative. The EA will be prepared according to the following timetable:

July 1, 2001……..Draft EA completed and distributed to the public for 30-day review; permitting requirements identified; Section 7 evaluation to U. S. Fish and Wildlife Service and the National Marine Fisheries Service

September 1, 2001…Comments incorporated; required permits obtained; Decision Document Signed

NEPA compliance will be through the development and distribution of an EA and Finding of No Significant Impact (if appropriate). The EA will be circulated to adjacent landowners and the local community and sent to the State Clearinghouse for distribution to State Agencies including the California State Reclamation Board and the California Department of Fish and Game. The Sacramento NWR Complex has a programmatic Section 7 Consultation in place that covers the operations and maintenance of the Sutter NWR. The refuge will also consult with the National Marine Fisheries Service.

For the purposes of this project, CEQA is not required because the activity is occurring on federal property and the USFWS is the lead agency.

8. Describe any other important aspects of your program that you could not address in the above items, and that you feel are critical to fully describing your project.

Butte Creek, as it traverses through the Butte Sink, Butte Slough, and Sutter Bypass to the confluence with the Sacramento River, is an extremely complex mix of diversion structures, operational schedules, and stakeholder/user groups. This complexity and interdependence of the various user groups and diversion structures, require a very high level of local stakeholder/user group input and represents the basis for the formation of the Lower Butte Creek Project. The dynamics of this project enhances the strong relationship between these upstream users and the downstream diverters. All the stakeholders are motivated to support the success of this project. Resolution of fish passage, agricultural and managed wetlands issues will guarantee water flexibility and facilitate the partnership between natural resource management and the agricultural community along the Sutter Bypass and throughout the Lower Butte Creek system. The effectiveness of this collaboration is demonstrated by the success of previously implemented projects.

The improvements proposed in this project support the Lower Butte Creek Project goals and significantly support the goals of the CALFED Bay-Delta Program. The project will implement "design, development and implementation of specific watershed conservation, maintenance and restoration actions" for ensuring adequate flows and habitat for anadromous fisheries and wetland habitat for waterfowl and other terrestrial species. The success of this project represents an important example of how stakeholders within the framework of a planning process are able to partner and coordinate resource and management actions to address vital fish passage issues on lower Butte Creek. This valuable action assists in fulfilling goals set by the Lower Butte Creek Project and by CALFED to effectively enhance the Central Valley Bay-Delta ecosystem.

The completion of this project will bring considerable benefits to water management, the facilitation of anadromous fish migration and migratory bird management within the Sutter Bypass and in lower Butte Creek. Rehabilitation of the existing water delivery system to the refuge will substantially alleviate the reliance on a weir and fish ladder (Weir 1). In the past, this structure has supplied water to approximately 350 acres in the southern part of the refuge via portable unscreened pumps (unscreened diversions) to ensure water delivery to flood managed wetlands. After project completion, this diversion and the unscreened pumps will not be necessary. This will result in the removal or substantial downsizing or redesign of Weir #1.

The agricultural community and the Sutter NWR have worked closely together to ensure that the redesign or removal of Weir #1will be compatible with local agriculture and will bring significant benefit to the enhancement of refuge habitat. By diligently working collaboratively on this project for over a year, there is full concurrence from all stakeholders in regards to full implementation. To date, approximately $120,000 has already been contributed by U.S. Fish & Wildlife Service ($95,000), Ducks Unlimited, Inc. ($15,000) and the David and Lucille Packard Foundation ($10,000) for design and engineering to ready this multiple-phased project for implementation. This process has truly been an example of cooperative community-based efforts to improve and enhance the valuable ecosystem within the Butte Creek Watershed.

Sutter National Wildlife Refuge Water Delivery System
CALFED WATERSHED PROGRAM PROJECT SUMMARY BUDGET FOR DUCKS UNLIMITED, INC.

Task Description	Labor Rate	Hours	Total Labor	Supplies	Travel	Materials	Match	CALFED	Total
Task 1: Environmental Compliance									
Task 2: Construction								**$5,000**	**$5,000**
2q. Survey Staking (Technician)	$55/hour	80	$4,400		$600				$5,000
Task 3: Project Management								**$20,000**	**$20,000**
3a. Construction Inspection (Professional)	$67/hour	112	$7,500						$7,500
3b. Construction Management (Professional)	$67/hour	150	$10,000						$10,000
3c. Contract Administration (Professional)	$67/hour	32	$2,144						$2,500
(Executive)	$81/hour	4	$324						
Task 4: Reporting and Presentations								**$7,500**	**$7,500**
4a. Quarterly Progress Reports (Professional)	$67/hour	37	$2,500						$2,500
4b. Draft Final Report (Professional)	$67/hour	37	$2,500						$2,500
4c. Final Report (Professional)	$67/hour	15	$1,000						$1,000
4d. Presentations (Professional)	$67/hour	15	$1,000						$1,000
Totals			**$31,368**		**$600**			**$32,500**	**$32,500**

Benefit/salary percentage	**34.00%**

Sutter NWR Water Delivery System

CALFED WATERSHED PROGRAM BUDGET AND PROJECT SUMMARY

Task Description	Completion Date	Match	CALFED Funds	Total
Task 1: Environmental Compliance	**12/31/01**	**$10,000**	**$20,000**	**$ 30,000**
Environmental Assessment to satisfy NEPA				
Task Products: All necessary compliance documents (Environmental Assessment)				
Success Criteria: Approval of new water delivery system				
Task 2: Construction (Upgrade of Water Delivery	**9/30/02**	**$132,000**	**$392,220**	**$524,220**
2a. Mobilization, Site Preparation, Demolition				$20,000
2b. Stripping -Levee and Borrow				$58,100
2c. Cleaning and excavation of ditch				$45,625
2d. Compacted Fill				$133,275
2e. Revegetation				$10,000
2f. Access Levee Gravel				$68,141
2g. Pump Station Improvements				$3,000
2h. Foot Bridges				$64,500
2i. Structures				$116,579
Includes Turnouts, concrete risers, HDPE pipe, eroosion control rock, and anti-seep collars				
2j. Survey Staking				$5,000
Task Products: Earth work and structures for new water delivery system				
Success Criteria: Completion of earth work and Installation of structures				
Task 3: Project Management	**9/30/02**		**$20,000**	**$20,000**
3a. Construction Inspection				$7,500
3b. Construction Management				$10,000
3c. Contract Administration (Record keeping, contractor payment, meeting setup)				$2,500
Task Products: Oversight and Inspection of construction; Oversight of contractual obligations				
Success Criteria: Successful completion of construction and contractual obligations				
Task 4: Reporting and Presentations	**12/31/02**		**$7,500**	**$7,500**
4a. Quarterly Progress Reports (Progress reports on implementation, financial status, products com				$2,500
4b. Draft Final Report (Summary of implementation. Deliveries, and finacial status)				$2,500
4c. Final Report (Report incorporating comments from Contract Manager)				$1,000
4d. Presentations (Summary presentation to CALFED)				$1,000
Task Products: Quarterly and final report; Presentation to CALFED				
Success Criteria: Submission of reports and presentation to CALFED				
Subtotal				$ 581,720
Indirect Overhead (16.25%)		$13,000	$ 81,530	$ 94,530
Total		$155,000	$521,250	**$ 676,250**